IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: MICHAEL A. JONES

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ART UNIT: 3749

FILED: 04/20/2004

EXAMINER: JIPING LU

TITLE: PNEUMATIC FLASH CALCINER THERMALLY INSULATED IN FEED STORAGE SILO

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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CERTIFICATE OF EFS-WEB TRANSMISSION

I hereby certify that on this 19th day of June, 2007, this correspondence is being transmitted via EFS-WEB to the United States Patent and Trademark Office, Attn: Examiner Jiping Lu (Art Unit 3749).

Alice B. Vanicek

TO THE COMMISSIONER FOR PATENTS

DECLARATION BY JOHN D. MACFADYEN, P. E.

I, John D. Macfadyen, hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that I have full knowledge and understanding of the fact that willful false statements and the like made herein are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that any such statements may jeopardize the validity of the above-referenced application or of any patent granted on it.

1. My resume is attached hereto and accurately reflects my education and work experience.

2. I am a graduate of the Colorado School of Mines where I received a Silver Diploma in Geological Engineering and a Silver Diploma in Metallurgical Engineering.

3. I am currently President of Phoenix Process Engineering, Inc., St. Peters, MO, a corporation engaged, among other things, in the design and construction of calcining plants. A company brochure is attached hereto.

4. I have over 40 years experience in minerals and metals processing with substantial emphasis on the development, design and operation of calcining plants.

5. I am aware that the above-identified U.S. patent application claims a calcining plant which comprises:

A. A calcining reactor which is internally uninsulated along the calcining zone.

B. A burner which is arranged to produce a flame within a region internally of the reactor and is designed to produce heated combustion gases and a calcining temperature of at least 1700°F internally of the reactor.

C. Means for producing a swirling flow of particulate material around the flame region and gradual mixing of the particulate material with the heated combustion gases.

6. I am aware that the above-identified applicant has participated in the design and construction of a calcining plant having the following features:

A. A calcining reactor comprising a vertical calcining pipe which is made of a high-temperature metal alloy and is internally uninsulated along the calcining zone.

B. A burner at the lower end of the pipe arranged to fire upward along the axis of the pipe and to produce calcining temperatures in excess of 1700°F internally of the calcining pipe.

C. Two diametrically opposed feed pipes for discharging particulate material into the calcining pipe tangentially so as to produce a swirling flow of particulate material around the flame region and gradual mixing of the particulate material with the combustion gases.

7. The temperature of the burner flame in the applicant's operational calcining plant ranges from about 2450°F to over 3500°F. In the absence of protective measures, the burner flame would heat the calcining reactor to a temperature sufficient to melt the high-temperature metal alloy of the reactor.

8. In the industry, the standard protective measure to prevent melting of a calcining reactor operating with an internally fired burner at calcining temperatures of 1700°F or more is to line the reactor with refractory insulation internally.

9. I understand that the Patent and Trademark Office has rejected the applicant's claims as anticipated by U.S. Patent Nos. 5,713,734 and 3,881,862 because the patents do not

expressly state that refractory insulation is used. However, I am familiar with the calcining systems of these patents and, contrary to the assertion of the Patent and Trademark Office, the calcining reactors of the patents consist of carbon steel vessels which are internally lined with refractory insulation. Were the refractory insulation eliminated, the calcining reactors of the patents would self-destruct before reaching operating temperature.

10. The applicant has recognized for the first time that the particulate material fed into a calcining reactor can be used to protect the reactor from a burner flame. To this end, the arrangement of the feed pipes in the applicant's operational calcining plant is such that a swirling flow of particulate material is produced around the burner flame so that the particulate material forms a barrier between the heat from the flame and the high-temperature alloy of the calcining reactor. As a result, the swirling flow of particulate material causes the temperature of the calcining reactor to remain below the melting point of the reactor. In addition, the swirling flow of particulate material prevents the calcining reactor from distorting or becoming dysfunctional.

11. I have observed the applicant's operational calcining plant successfully calcine particulate materials at calcining temperatures exceeding 1700°F with no damage to the calcining reactor in spite of the absence of insulation along the calcining zone internally of the reactor.

12. The applicant's concept of operating a calcining reactor without internal insulation along the calcining zone is novel in the industry and totally unobvious. The mindset in the industry is that internal insulation along the calcining zone is an absolute requirement and nobody prior to the applicant has suggested that a calcining reactor operating with an internally fired burner at calcining temperatures of 1700°F or more can survive in the absence of internal insulation along the calcining zone. In this connection, I understand that the Patent and Trademark Office has further rejected the applicant's claims on the ground that, even if the calcining reactors of U.S. Patent Nos. 5,713,734 and 3,881,862 have refractory insulation, it would be obvious to one of ordinary skill in the art to eliminate the refractory insulation in order to achieve savings. Based on my extensive experience in the calcining industry, I can state categorically that this assertion has no basis whatsoever and that a worker of ordinary skill in the calcining industry would never think of eliminating internal insulation from the calcining zone of a calcining reactor operating with an internally fired burner at calcining temperatures of 1700°F or more. Furthermore, the calcining systems of the patents feature a relatively low fuel consumption approximately equal to 40% of the fuel consumption of prior calcining systems. Since the refractory insulation internally of the calcining reactors of the patents contributes to such low fuel consumption by conserving heat, the Patent and Trademark Office is in error when stating that it would be obvious to eliminate this refractory insulation.

13. Over the last 40 years, I have investigated and become informed of several means for calcining materials in the lime, cement and other process industries using calcining reactors such as those of U.S. Patent Nos. 5,713,734 and 3,881,862 as well as other types of calcining reactors. All of these reactors are dependent on internal refractory insulation and none are comparable to the applicant's claimed system.

14. In summary, I believe that the elimination of internal insulation along the calcining zone is a unique feature which enables substantial savings to be achieved.

Respectfully submitted,

By: John D. Macfadyen Dated: APRIL 19, 2007
John D. Macfadyen, P.E.